

中国能效标准的发展与展望

The Development and Envision of China's Energy Efficiency Standards

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China National Standardization Technical Committee for
Energy Basis and Management

2004-08



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- 能效标准的特点、作用
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- 中国能效标准的发展
- 中国能效标准的现状

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- Basic concept and
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- The Characteristics,
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- The development of China's
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- Basic situation of China's EES



- 能效标准的实施
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- 能效标准领域的国际合作情况
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- The implementation of EES
- Energy conservation potential estimation of EES
- International cooperation in energy efficiency standard field
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- The proportion of the energy consumption of household appliances over that of the building's

用途(usage)	耗能量(Energy consumption) 10 ⁶ tce	所占比例 (Proportion) (%)
城镇采暖(heating, urban)	134	37.4
农村采暖(heating, rural)	23	6.4
空调(air-conditioner)	41	11.5
照明、家电(lighting, household appliances)	25	7.0
炊事、热水(cooking, water heating)	135	37.7
总计(total)	358	100



□ 家用电器、视听产品以及办公设备平均待机能耗已经占到了家庭总能耗的10%左右，相当于每个家庭使用着一盏15~30W的“长明灯”

□ Average Standby energy consumption for household appliances, audio-Visio products and office equipment takes about 10% of the total family energy consumption, which is the same as burning a lamp of 15~30W all the time

用能产品待机能耗 Standby energy consumption



产品名称 Product name	平均待机能耗 Average standby energy consumption (w)	待机时间 Stand by time (h)
彩色电视机(color TV)	8.1	2
显示器(Display)	5.43	4.6
微波炉(Microwave oven)	2.7	23.5
复印机(duplicating machine)	12	6
打印机(Printer)	20	7.5
传真机(Fax machine)	6.8	22.7



- 工业能源消费占全国能源总消费量的70%以上
- 在工业领域，主要产品能耗比国际先进水平加权平均高出40%以上
- 中国工业锅炉每年消耗原煤近4亿吨，实际运行效率约60-70%，比先进国家低10-15%
- Industrial energy consumption takes more than 70% of the nation's total energy consumption
- The energy consumption of major energy consumption products consume 40% (weighted average) more energy compared with that of the advanced international level
- Industrial boilers consume 0.4 billion tons of raw coal yearly, the actual operating efficiency is 60-70% which is 10-15% lower than that of the advanced countries'



- 泵类产品年用电量约占全国发电量的20%
- 电动机总装机容量已达4亿kW，年用电量占全部工业用电量的60%以上
- 风机拖动系统消耗的电力约占全国电力消费总量的10.4%，年耗电量约为810亿kWh
- Annual energy consumption for pump products takes about 20% of the total nation's electricity generation
- Total installed capacity of motors has reached 0.4 billion kW, the annual electricity consumption takes more than 60% of the total industrial electricity consumption
- Energy consumed by fan-dragged system is about 81 billion kWh, which takes about 10.4% of the total nation's electricity consumption



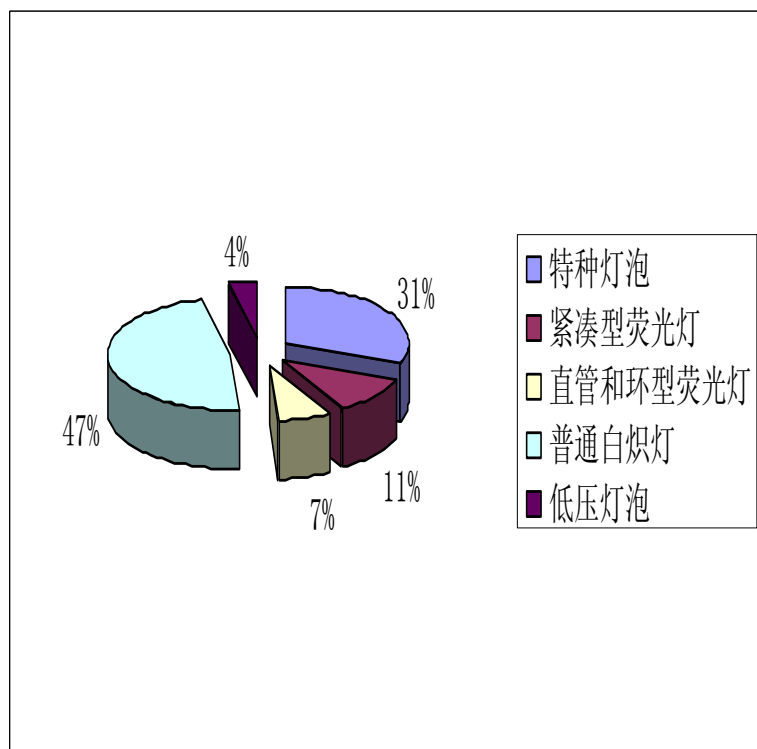
- 中国电光源行业经过50多年的发展，目前的产量约74亿只，已跃居世界首位
- 中国照明用电量占全社会用电量的12%，在终端用电量中仅次于电动机居第二位
- After more than 50 years development , the annual output of China's lighting industry is about 7.4 billion, which is the largest in the world
- Electricity consumed by lighting takes about 12% of the total nation's electricity consumption, second only to motor among end use products

照明产品及其能效现状

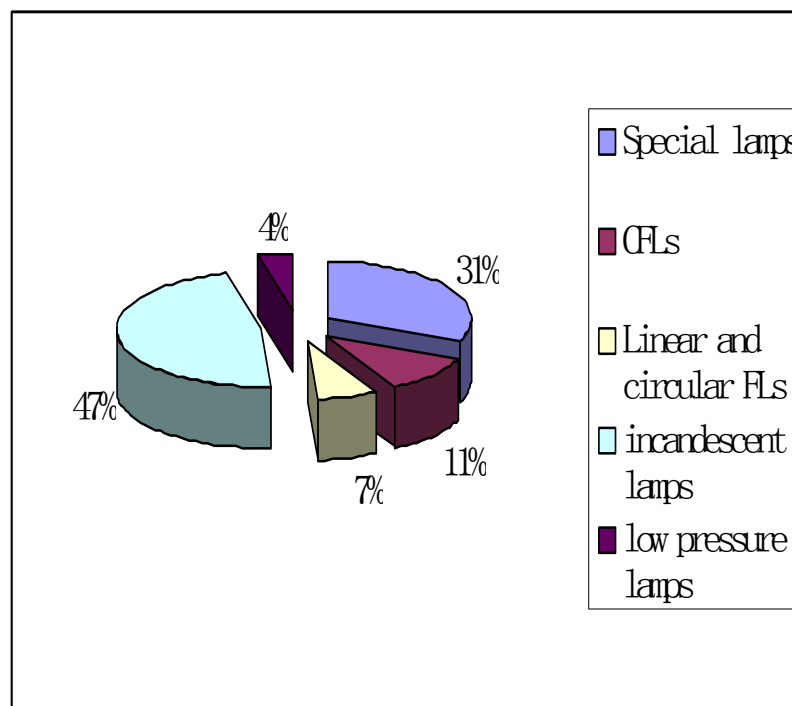
Lighting products and their energy efficiency status



不同种类光源所占的比例



Proportion of different kinds of light sources





□ 能效标准是在不降低产品的性能和安全要求的前提下，对用能产品的能源性能做出具体的要求。既技术可行，又经济合理，有利于消费者，又不损坏生产商的利益。

□ EES is a special kind of standards which set detailed energy performance requirements without lowering the safety and performance requirements. The requirements have been proven to be technically feasible and economically justifiable which will be beneficial to the consumer, and will not harm the interest of manufactures.



□ 根据内容分为:

指令性标准

最低能源性能标准

平均能效标准

能效分级标准

□ By contents:

Instructive standard

MEPS

**Class-average
standard**

**Energy-rating
standard**



□ 根据时间和指标水平的不同：

现状标准

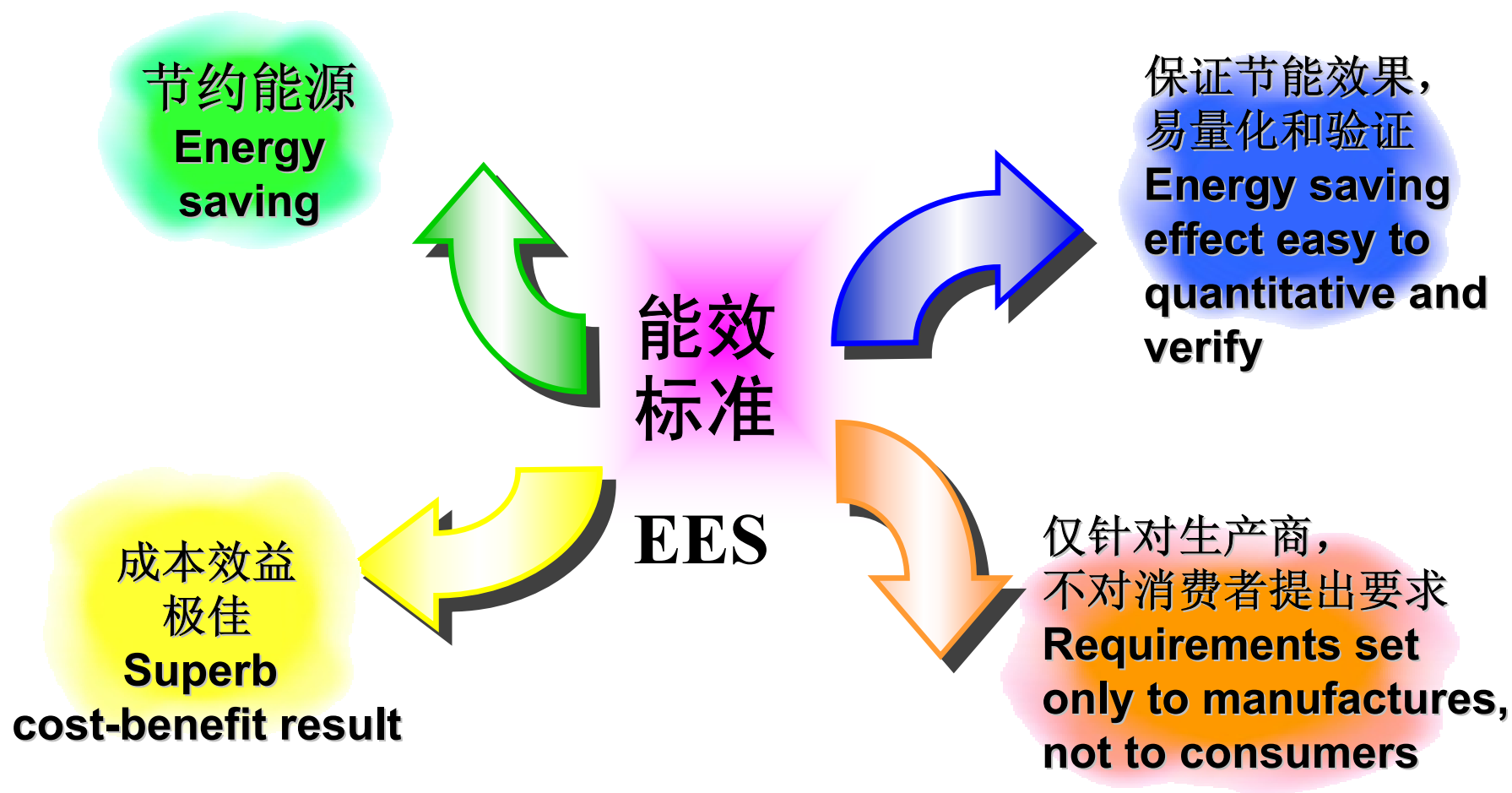
超前标准

□ By the difference of time and index level:

Present status standard

Reach standard

能效标准的特点 Characteristics of EES





□ 对消费者

提高了广大消费者的总体利益，又不严格限制他们对产品的选择

□ 对生产企业

规范市场，促进企业间的良性竞争和节能技术的开发，在全球市场中更具竞争力

□ 对国家

减少能源供应基础设施的投资，提高国家的经济实力，从根本上减少了污染，保护了环境

- To consumers: Raised the overall benefit of consumers without restricting their product choices
- To manufactures: Regulate market, promote well ordered competition among manufactures and the development of new energy conservation technologies, enhance their market competition ability
- To the country: Reduce the investment of energy supply infrastructure, enhance the nation's economic power, reduce pollution and protect the environment



□ 上世纪80年代的起步阶段

第一批共9项家用电器能效标准，1989年12月25日批准发布，1990年12月1日强制实施

□ Starting stage: 1980's in the last century

First group of energy efficiency standards for household appliances, promulgated on December 25 1989, implemented on December 1, 1990



□ 上世纪90年代中的稳步发展阶段

能效标准涉及的产品范围由家用电器逐步扩展到照明电器、商用产品以及工业耗能设备

□ Steadily development stage: 1990's in the last century

The coverage of EES is expanded from household appliances to lighting product, commercial and industrial equipment



□ 新世纪的提高阶段

针对部分产品组织
有关超前能效指标和能
效分等分级指标的研究
工作

□ Improvement stage: after 2000 in the new century

Research work on
“reach standard” and
energy grading for
some selected
products

已发布的能效标准 EES already published



标准号 Standard number	标准名称 Standard name	备注 Note
GB12021.2-2003	家用电冰箱电耗限定值及节能评价值 The maximum allowable values of the energy consumption and evaluating values of energy conservation for household refrigerators	第二次修订 Second revision
GB12021.3-2000	房间空气调节器能效限定值及节能评价值 The limited values of energy efficiency and evaluating values of energy conservation for room air conditioners	正在进行第二次修订 Second revision in progress
GB12021.4-1989	家用电动洗衣机电耗限定值及测试方法 The limited value and testing method of energy consumption for household electric washing machines	已完成修订 First revision finished
GB12021.5-1989	电熨斗电耗限定值及测试方法 The limited value of energy consumption and method of testing for electrical iron	正在进行修订 Revision in progress
GB12021.6-1989	自动电饭锅效率、保温电耗限定值及测试方法 The limited value and testing method of efficiency and warming energy consumption for automatic rice cookers	正在进行修订 Revision in progress
GB12021.7-1989	彩色及黑白电视广播接收机电耗限定值及测试方法 The limited value and testing method of electrical energy consumption for broadcasting receiver of colour and monochromic television	正在进行修订 Revision in progress
GB12021.8-1989	收录机效率限定值及测试方法 The limited value of efficiency and methods of measurement on radio receivers and recorder	

已发布的能效标准(续) EES already published



标准号 Standard number	标准名称Standard name	备注 note
GB12021.9-1989	电风扇电耗限定值及测试方法 The limited value of energy consumption of electric fans and its measuring method	
GB 17896- 1999	管形荧光灯镇流器能效限定值及节能评价值 Limited values of energy efficiency and evaluating values of energy conservation of ballasts for tubular fluorescent lamps	
GB 18613-2002	中小型三相异步电动机能效限定值及节能评价值 Limited values of energy efficiency and evaluating values of energy conservation of small and medium three-phase asynchronous motors	
GB 19043-2003	普通照明用双端荧光灯能效限定值及能效等级 Limited values of energy efficiency and rating criteria of double-capped fluorescent lamps for general lighting service	
GB 19044-2003	普通照明用自镇流荧光灯能效限定值及能效等级 Limited values of energy efficiency and rating criteria of self-ballasted fluorescent lamps for general lighting service	
GB 19153-2003	容积式空气压缩机能效限定值及节能评价值 Limited values of energy efficiency and evaluating values of energy conservation for displacement air compressors	
GB 19415-2003	单端荧光灯能效限定值及节能评价值 Limited values of energy efficiency and evaluating values of energy conservation for single-capped fluorescent lamps	

已完成研究的能效标准 EES already developed



- 通风机能效标准
- 清水离心泵能效标准
- 家用电动洗衣机能效标准
- 彩色电视机能效标准
- 高压钠灯能效标准
- 高压钠灯镇流器能效标准
- 冷水机组能效标准
- 单元式空调能效标准
- 房间空气调节器能效标准

- EES for ventilator
- EES for centrifuge
- EES for household washing machine
- EES for color TV
- EES for High pressure sodium lamps
- EES for the Ballast of HPSL
- EES for cold water cooling unit
- EES for unit air conditioner
- EES for room air conditioner



- 燃气热水器能效标准
- 电力变压器能效标准
- 电源适配器能效标准
- 金属卤化物灯能效标准
- 金属卤化物灯镇流器能效标准
- EES for gas water heaters
- EES for transformers
- EES for power source adapters
- EES for metal halide lamps
- EES for the ballast of metal halide lamps



□ 1989年颁布的第一批能效标准:

能效限定值（电耗限定值）

□ 1995年后新修订的能效标准:

能效限定值
节能评价

□ First group of EES promulgated in 1989:

Limited values of energy efficiency (limited values of electricity consumption)

□ EES revised after 1995:

limited values of energy efficiency and evaluating values of energy conservation



- 2000年开始，根据节能工作的需要和各种用能产品的特性，某些家电、照明器具能效标准的主要内容有所扩展：

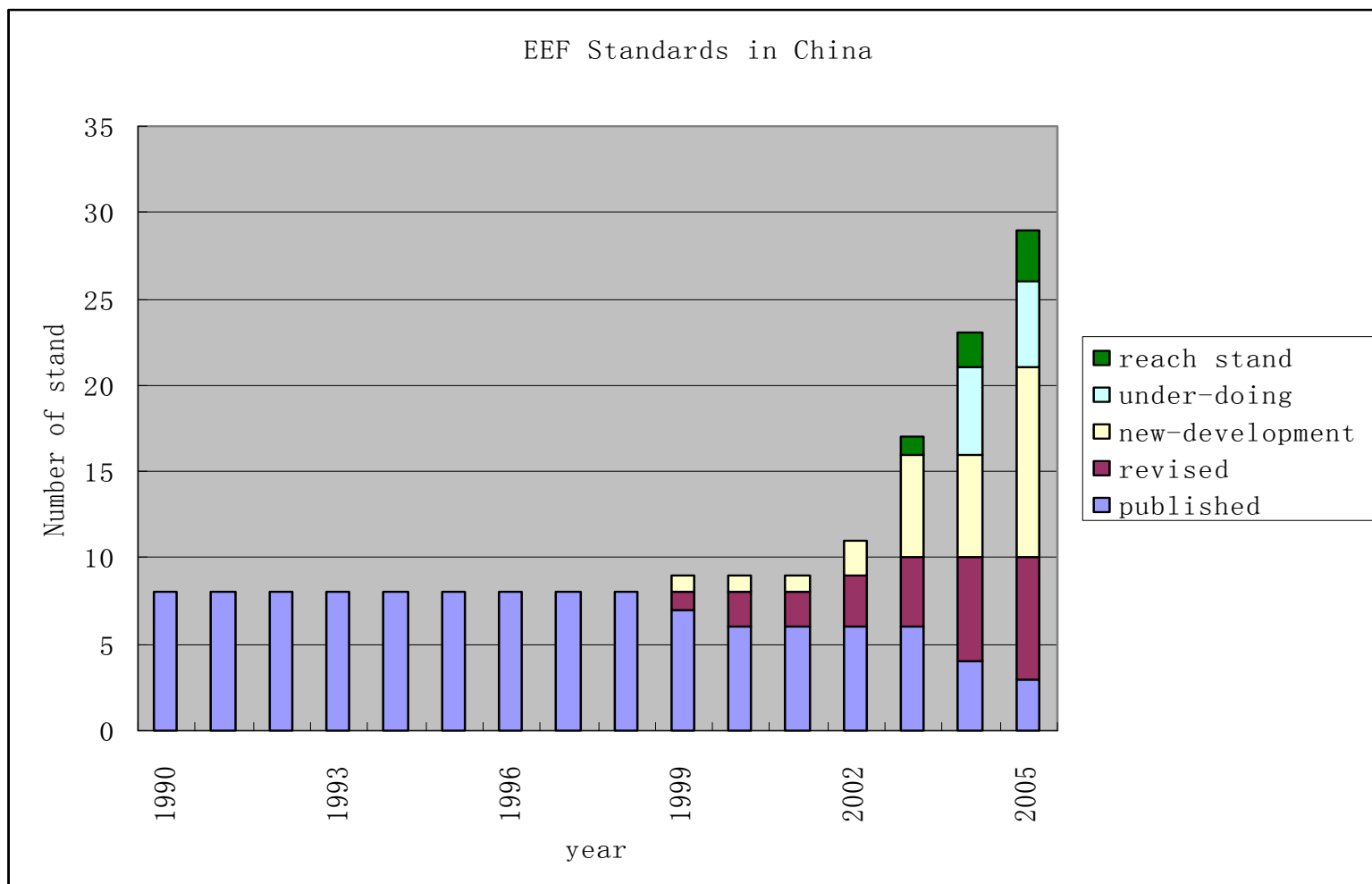
能效限定值
节能评价
能源效率等级
超前能效指标

- Since 2000, according to the need of energy conservation work and the special features of different products, the contents of EES for some household appliances and lighting products are extended:

Limited values of energy efficiency; evaluating of energy conservation; energy grading criteria and “reach” energy efficiency index

能效标准发展进程示意图

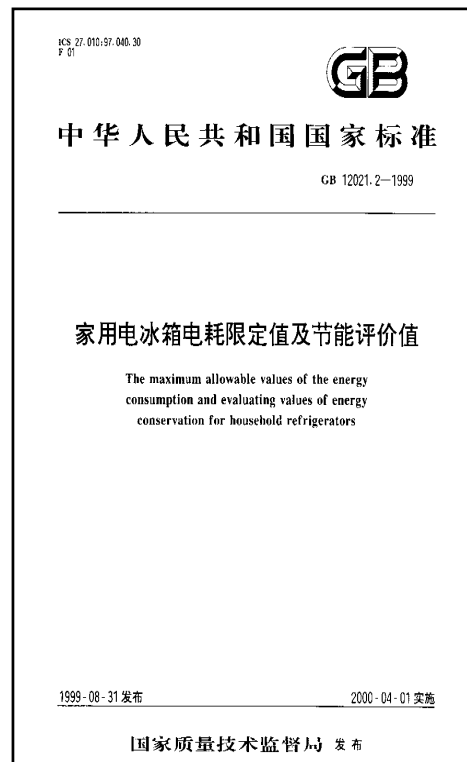
Sketch map of the development of EES



中国能效标准的基本内容 Contents of China's EES



- 产品的基本分类
- 能效限定值
- 节能评价值
- 能效分等分级
- 超前能效限定值
- 测试方法
- 检验规则



- Product classification
- Limited values of energy efficiency
- Evaluating values of energy conservation
- Energy grades
- Target limited values of energy efficiency
- Test methods
- Checking and inspection rules

举例：家用电冰箱能效标准

Example: EES for household refrigerators



□ 能效指标：24小时耗电量

□ 主要内容：
耗电量限定值
能源效率等级
节能评价值
超前耗电量限定值指标
实验方法
检测规则

□ 能效等级

能效指数 Energy efficiency index	能效等级 Energy grade
$\eta \leq 55\%$	1
$55\% < \eta \leq 65\%$	2
$65\% < \eta \leq 80\%$	3
$80\% < \eta \leq 90\%$	4
$90\% < \eta \leq 100$	5

□ Energy efficiency index:

Electricity consumption in 24h

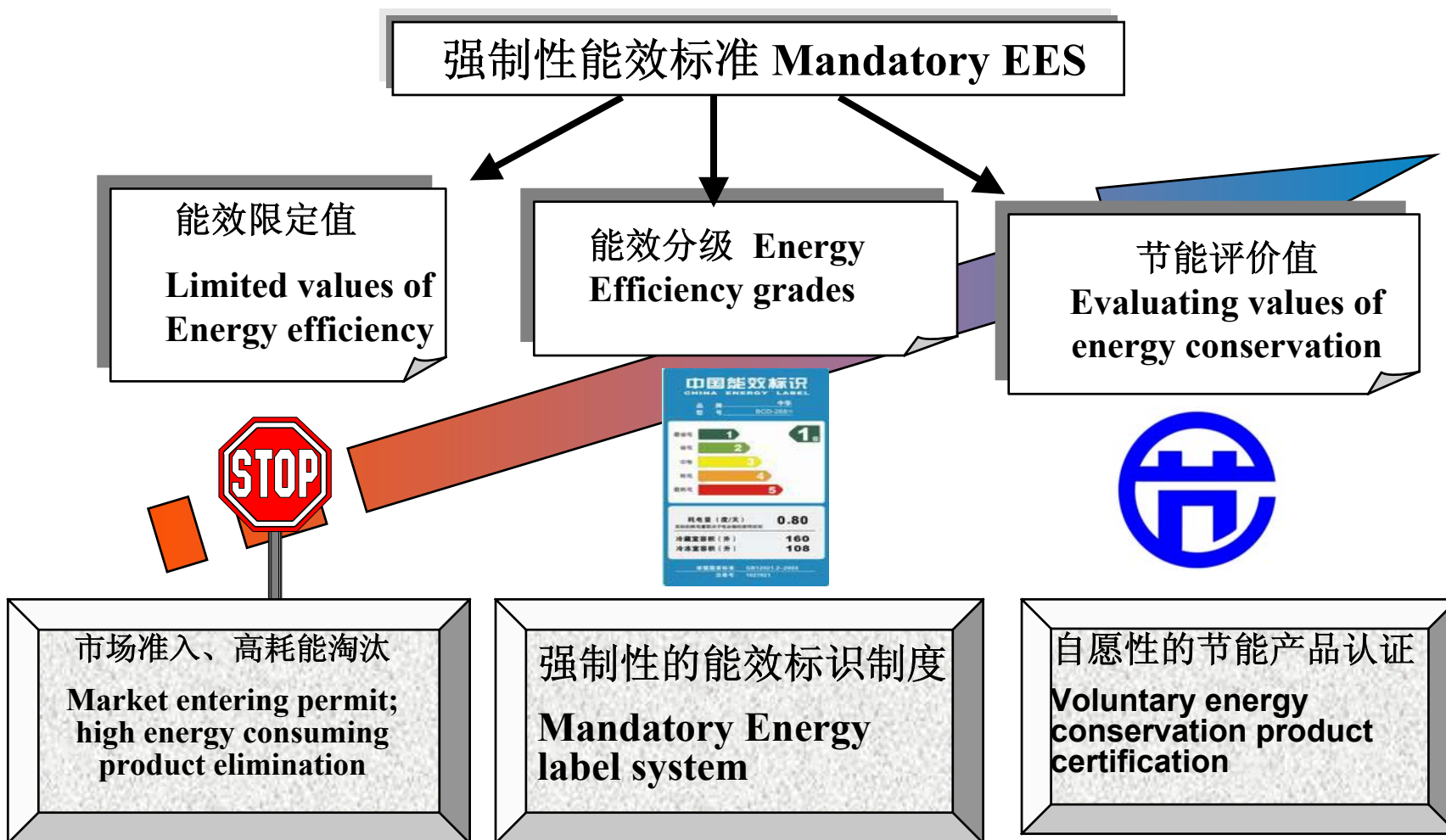
□ Main contents:

limited values of energy consumption; energy efficiency grades; evaluating values of energy conservation; target limited values of electricity consumption; test methods; checking and inspection rules

□ Energy efficiency grades

能效标准的 实施框架

Implementation framework of EES





□ 1998年，依照《节能法》的有关要，由原国家经贸委头并组织建立起自性的节能产品认证度，属于产品质量证范畴

□ In 1998, According to the requirements of “The energy conservation law”, headed by the former SETC, the certification of energy conservation system was established. This system belongs to the scope of product quality certification.



□ 一种保证标识（标志），表示用能产品已达到规定的能效标准或相关要求，但并不能表示达到的程度，通常针对能效排在前20%左右的产品。标识上没有具体信息，目的是使消费者能快速确认比较好的产品

□ The label of energy conservation certification belongs to the category of endorsement label. It shows that the product obtained the label has reached the requirements in the energy efficiency standard. Normally this label is issued to the products ranking among the top 20%. There is no detailed information on the label. The aim is to make consumer quickly recognize the relatively good products among others.



□ 已开展认证的产品有：

家用电器

照明产品

工业用耗能设备

办公设备，等

□ **Product coverage of the present certification:**
household appliances;
lighting products;
industrial energy
consuming equipment;
office equipment etc.



- 变形的“长城”和外型“c”代表“中国”
- the distorted “ Great Wall” and letter C of the outline, represents “China”**
- 主体是变形的中文“节”字、外型是energy的“e”代表“节能”
- The main body is a modified Chinese Character for energy conservation, There is a letter “e” in the framework, representing “ energy conservation**
- 天蓝色，代表蔚蓝的天空，寓意“节能、环保和美好未来”
- blue sky, indicating “energy conservation, environmental protection and a glorious future**



- 国外成功经验的调研与分析整理
- 在中国开展能效标识制度的可行性分析
- 起草《能源效率标识管理办法》
- Investigation and analysis of overseas successful experiences
- Feasibility study for implementing the energy efficiency label system in China
- Preparing the “Management method of energy efficiency label”



- 组织设计、市场调查能效标识图案
- 研究家用电冰箱能效标识实施规则
- 组织研制系列能效标准，如冰箱、洗衣机、空调、照明产品
- Organize the design and market survey of the label pattern of energy efficiency label
- Research on the detailed implementation rules of energy efficiency label for household refrigerators
- Organize the development of series of energy efficiency standards for refrigerators, washing machines, air conditioners and lighting products etc.

能效标识的概念

The concept of energy efficiency label



□ 是指表示用能产品能源效率等级等性能指标的一种信息标识，属于产品符合性标志的范畴

□ 中国将采用**能效等级标识**，这种标识最有利于我国消费者的理解，能有效地影响消费者的购买决定



□ An information label indicating the product energy efficiency grade. It belongs to the category of conformance label

□ China will use the energy grading label. This label is easy for consumer to understand and effectively influence their purchase decisions.



□ 强制实施统一的能源效率标识制度

- 国家对节能潜力大、使用面广的用能产品实行统一的能源效率标识制度

□ Implement the unified mandatory energy efficiency label system

- The government will first implement the energy label system for the products with huge energy conservation potential wide usage.



- 国家制定并公布《中华人民共和国实行能源效率标识的产品目录》，确定统一适用的产品能效标准、实施规则、能源效率标识样式和规格
- 凡列入《目录》的产品，应当在产品或者产品最小包装的明显部位标注统一的能源效率标识，并在产品说明书中说明
- The government will develop a product list for the implementation of energy label system and define unified energy efficiency standards, implementation rules and label pattern.
- Products covered in the list should have the label attached on the obvious part of the smallest package of the product and explain in detail in the product instruction manual.



“企业自我声明+备案+市场监管”

**“Enterprise self-declaration
+ recording keeping +
market surveillance”**

优点:

- **效率高，不会影响新产品进入市场的时间**
- **由于实施成本低，基本不会增加产品的价格**

Advantages:

- **high efficiency, will not delay new products from entering into the market**
- **low implementation cost, basically will not increase product cost.**

能效标识制度的 管理体制

The management of energy label system



□ 国家发展和改革委员会、国家质量监督检验检疫总局和国家认证认可监督管理委员会负责能源效率标识制度的建立并组织实施

□ National Development and Reform Commission (NDRC), General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ) and Certification Accreditation Administration of the People's Republic of China (CNCA) for the establishment and implementation of energy efficiency label system

能效标识制度的 管理体制

The management of energy label system



□ 地方各级人民政府节能管理部门，地方质量技术监督部门和各级出入境检验检疫机构，在各自的职责范围内对所辖区域内能源效率标识的使用实施监督检查

□ The energy conservation management departments of local governments, local quality supervision departments, and the inspection and quarantine organizations for import and export of different levels will implement and supervise the implementation of energy label within the scope of their responsibilities.

部分候选能效标识样式

Some of the label pattern candidates



3

我国能效标准节能潜力预测

Energy conservation potential estimation



□ 据对彩色电视机、空调、电冰箱、电饭煲、洗衣机、消费性电子产品和办公设备（待机能耗）、荧光灯等近20种耗能产品所作的节能潜力分析，制定和有效实施新的能效标准，到2010年，累积节电折合一次能源2.56亿吨标准煤；到2020年，折合一次能源12.9亿吨标准煤

□ According to energy conservation estimation for nearly 20 products such as color TV, washing machine, and office equipment etc, after effective implementation of the newly developed energy efficiency standards, the cumulative energy saved will be equal to 256 million tons of standard coal by the year 2010; and 1.29 billion tons of standard coal by the year 2020



- 能效标准是全球关注的节能话题，已有34个国家有效实施了能效标准
- 中国能效标准在研制过程中广泛吸收了国际的成功经验和先进的分析方法，并与许多国家进行充分沟通和交流

- Energy efficiency standard has been attached global importance, 34 countries have already effectively implemented energy efficiency standards.
- China has broadly make use of the successful international experience and analytical method in the research and development of energy efficiency standards and communicated well with many other countries on this behalf.



□ 中国能效标准的研制得到美国能源基金会、美国劳伦斯.伯克利国家实验室、联合国开发计划署、全球环境基金、标识和器具标准合作项目、国际铜业协会、国际节能研究所等国际机构和专家的支持与帮助

□ The research and development of China's energy efficiency standards has gained support from many international experts and organizations such as the EF, LBNL, UNDP, GEF, CLASP, ICA, IIEC etc.



- 继续组织研制、修订能效标准，包括办公设备、工业设备等
- 加强超前能效标准的研究。目前正在组织电动机超前能效标准的研究，风机、水泵和空压机也在考虑中

- Continue organize the development and revision of energy efficiency standards including office and industrial equipment
- Strengthen the research of “reach” standards. At present, the research for the “reach” standard for motor is under going and the research for fans, pumps and air compressors is under consideration



- 研究工业设备的能效等级指标
- 加强能效标准实施、监督机制研究
- 与其他地区、国家和有关机构开展更加密切的合作与交流，参加标准一致性活动，减少贸易障碍

- Research on the energy efficiency grading criteria for industrial equipment
- Strengthen the research on the implementation and supervision scheme
- Conduct closer cooperation and exchange with relevant international organizations in other regions and countries, participate in the consistency activities for standards in order to reduce trade barrier.

请与我们联系

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